

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA



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Order Instituting Rulemaking to Implement the
Commission's Procurement Incentive Framework
and to Examine the Integration of Greenhouse
Gas Emissions Standards into Procurement
Policies.

Rulemaking 06-04-009
(Filed April 13, 2006)

REPLY COMMENTS OF THE COMMUNITY ENVIRONMENTAL COUNCIL
ON NATURAL GAS SECTOR POINT OF REGULATION ISSUES

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January 8, 2008

REPLY COMMENTS OF THE COMMUNITY ENVIRONMENTAL COUNCIL
ON NATURAL GAS SECTOR POINT OF REGULATION ISSUES

The Community Environmental Council (“CE Council”) respectfully submits these reply comments in accordance with the “Administrative Law Judges’ Ruling Requesting Comments on Type and Point of Regulation Issues for the Natural Gas Sector” (“ALJR”), dated November 28, 2007.

The CE Council is a member-supported environmental non-profit organization formed in Santa Barbara in 1970 and is the leading environmental organization in our region. In 2004, the CE Council shifted its primary focus to energy and transportation issues and we are spearheading a regional effort to wean our communities from fossil fuels, on a net basis, during the next two decades. We are almost unique in combining on the ground work on a number of energy and climate change-related issues with our work on state and federal policy issues. Our state policy work is directly informed by our experience with what has worked, or is likely to work, at the local level. More information on the CE Council and our energy programs may be found at www.fossilfreeby33.org.

A summary of the CE Council’s reply comments follows.

- Many parties generally support the Staff Recommendations, as does the CE Council.
- The CE Council supports a cross-sectoral cap and trade regime, if a cap and trade regime is created. Cross-sectoral trading will be key for well-functioning carbon markets.
- Many parties mistakenly assert that there are limited ways in which distribution utilities (LDCs) may find substitutes for natural gas, overlooking the fact that solar hot water and solar air heating, ground

source heat pumps, biogas, biomass for heat, and many other technologies may substitute for natural gas end-use, with the economics of each solution situation-specific

- The CE Council supports NRDC/UCS' call for a renewable fuel portfolio standard for distribution utilities, which would require a certain percentage of biogas (biomethane), or seep methane, to be used
- Parties' opinions are mixed on deferral of a cap and trade system in California. While acknowledging that there is no "right answer" to this question, CE Council reiterates its support for proceeding forward without delay

I. Discussion

A. Party responses re market mechanisms

The CE Council discussed in opening comments the fact that a cap and trade system is not the only available market mechanism – and possibly not the ideal mechanism. In particular, carbon fees (revenue neutral) are being increasingly supported by a wide swath of policymakers, academics and the public as a better policy instrument than cap and trade.

We are encouraged that NRDC/UCS also discuss these issues in their opening comments, stating at page 3:

There are several types of market mechanisms that should be considered in California’s implementation of AB 32, among which “cap-and-trade” is just one type of market policy tool. Other market mechanisms that should also be considered include incentives, fees, rebates, and taxes (although a tax would need to be established by the Legislature or the voters).

At the least, the Commission should consider market mechanisms other than cap and trade before deciding on the optimal policy solution.

B. Party responses re cap and trade for the natural gas sector

Most parties support cap and trade for the natural gas sector instead of purely programmatic solutions, which were the two choices provided by the Commission in questions presented. However, SDG&E, PG&E, California Manufacturers and Technology Association (CMTA), Southwest Gas Co. and the

Green Power Institute¹ do not support cap and trade for this sector. All of these parties cite the absence of viable alternatives to natural gas as the primary reason not to impose a cap on this sector. SCE (p. 9) also cites the lack of viable alternatives to natural gas, while supporting a cap and trade regime for the natural gas sector.

However, there are many viable alternatives to natural gas, including electricity substitution for heating and cooking, solar hot water, solar air heating, biogas (biomethane), seep gas (from ocean sources²), biomass (for heat or electricity), ground source heat pumps (passive geothermal), asphalt heat pumps (also passive geothermal), and of course the full array of natural gas efficiency measures. Last, conservation (behavior change) is also an option that can be incentivized by the utilities.

The National Renewable Energy Laboratory estimates that solar water heating alone could, in California, reduce natural gas demand by 106 trillion btus, or 1.06 million therms, 15% of the total current demand in California (for electricity generation and other uses).³ This is equivalent to 5.9 million metric tons of CO₂e, as CalSEIA and SRCC point out in their opening comments, citing the same NREL report (p. 3.) Technical potential does not consider the economics of each technology, however, so it will be necessary to perform further analysis in terms of the economic potential of solar hot water in California, under the new incentive system and with likely price breaks over the next decade.

¹ Green Power Institute also states that “natural gas is natural gas.” (P. 2.) However, when we consider lifecycle emissions of various natural gas supplies, we quickly realize that all natural gas is not created equal. This is the climate change proceeding and it would behoove the Commission to consider the full impacts of energy consumed in California (see CE Council’s opening comments).

² Venoco, Inc., already collects about 300,000 cubic feet per day of seep gas off the coast of Santa Barbara.

³ NREL, “Technical Potential for Solar Water Heating Technology to Reduce Natural Gas Demand in the United States,” (2007).

The economics of each solution is highly dependent on each location and installation. Ground source heat pumps, however, are reportedly economic in many locations.⁴ Solar hot water, as mentioned, is generally not strictly economically competitive, but it is likely to become so over the next decade, particularly as new financial models become available, as we have witnessed in the large PV sector (3rd party financing allows the end-user to avoid any capital outlay and pay approximately the same amount to the 3rd party as they would, on a per-unit of energy basis, to the utility).

A full discussion of these issues is beyond the scope of these comments, but if it becomes a major factor in the Commission's decision, the Commission should request a full discussion before making a decision. There is a growing body of scholarship in this area and many relevant developments over the last few years, of which many parties are not aware.

Southwest Gas Co. states that a "C&T regime in the natural gas sector ... will likely just add additional costs and complexity to achieve the same level of reductions." This statement overlooks the obvious benefit of a well-functioning C&T system: defined GHG reduction levels. Under programmatic initiatives, there are not necessarily defined achievement levels, though certainly programmatic initiatives could be used to achieve the same level as a cap. But then we would have a "cap" with no "trade," which I'm sure Southwest would consider worse than C&T together.

⁴ See http://www.forester.net/de_0703_global.html, citing two to three year payback periods, but without any detailed analysis. A detailed analysis by the PIER program on 20 California GSHP sites found paybacks were longer, from seven years to twenty years: http://www.energy.ca.gov/geothermal/fact_sheets/geothermal_projects/SMUD-TRUCKEE-GEO_HEATPUMP.PDF. An older (1995) analysis by the Geo-Heat Center in Oregon, of 256 installations, found paybacks ranging from 1.3 to 14 years, with a mean payback for commercial building installations of 2.8 years: <http://geoheat.oit.edu/pdf/hp1.pdf>.

The other major benefit of a C&T system is that, at least in theory, emissions reductions may be obtained at the least cost.

C. Responses to specific party comments

NRDC/UCS recommend a renewable fuel portfolio standard for the NG sector (p. 8, opening comments). The CE Council welcomes this suggestion and agrees that this would be a productive policy tool.

NRDC/UCS focus on biomethane (biogas) in their comments and while the CE Council fully supports increased use of biomethane, the Commission should also consider incentivizing the use of seep tent methane, such as that collected by companies in the Santa Barbara region (as mentioned in our opening comments). Much of this seep tent methane would otherwise escape into the atmosphere and marine environment,⁵ so it will be environmentally and climatically beneficial to capture more of the naturally seeping methane and use it as a substitute for mined natural gas.

We must quibble with CalSEIA/SRCC's comment that "the economics of solar water heating should be evaluated differently than energy efficiency measures since generation, in combination with efficiency, can achieve natural gas consumption reductions unachievable through efficiency alone." (P. 5.) It is not clear why the fact that solar water heating can achieve natural gas savings above energy efficiency measures alone should lead to a different economic analysis for solar water heating. Rather, all technologies should be considered based on their

⁵ A recent research paper from a team at UC Santa Barbara found that only 1 percent of the seep methane reaches the atmosphere, so it is not clear at this point at what point the downsides of impacting the marine environment through expanded seep tent activity outweigh the upsides of reducing methane emissions. This topic should be examined in more detail.

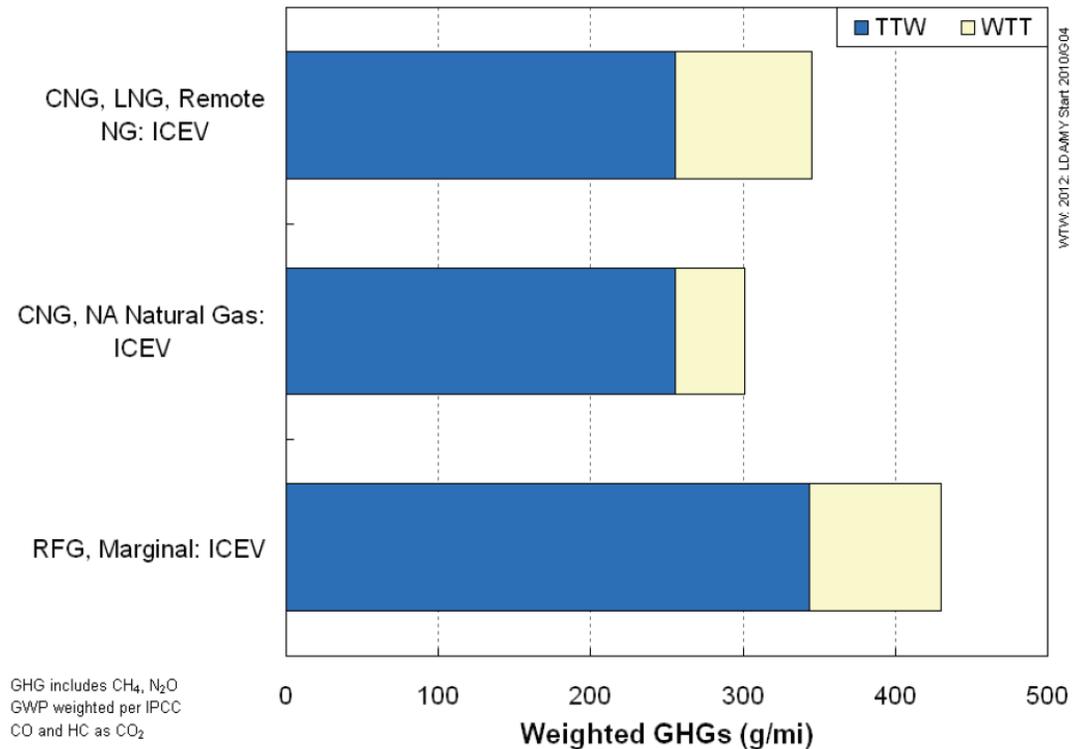
potential to reduce greenhouse gas emissions in a cost-effective manner. As we note in our opening comments, solar water heating technologies are still generally expensive, even with likely rebates at the state level and existing tax credits. Accordingly, we look forward to further cost reductions from the private sector and installers, as well as improvements to the technology.

Looking ahead, electrification of the transportation sector may also have the effect of reducing natural gas use. With the current push for natural gas (CNG or LNG) vehicles as alternatives to petroleum, we may see significant natural gas use in the transportation sector over the next ten or twenty years. However, at the same time, vehicles should become available that can run on electricity, such as electric-drive vehicles, plug-in hybrid electric vehicles, and possibly hydrogen ICE or fuel cell vehicles, which may use electricity indirectly through electrolysis of water. If this is the case, distribution utilities may reduce end-user natural gas use by incentivizing EVs, PHEVs, and hydrogen vehicles as alternatives to natural gas vehicles – assuming there are net benefits from such a switch when we consider all the relevant factors.

Clean Energy Fuels Corporation (CEFC) states that “natural gas in transportation helps California achieve its overall GHG emissions reduction targets....” While CNG and LNG vehicles do enjoy lower point-source emissions, it is not at all clear that lifecycle emissions are lower.

The chart that CEFC includes (Figure 2, p.7) is from a TIAX presentation early in the AB 1007 process. The revised final report was released on August 1, 2007, and contains a revised analysis. The relevant chart from the revised final report is Figure 1 (TTW is “tank to wheels” and WTT is “well to tank,” which jointly represent the entire fuel lifecycle).

Figure 1. Well to wheels (lifecycle) GHG emissions for CNG, LNG and reformulated gasoline fuels.⁶



Accordingly, if CNG or LNG is used as a petroleum substitute, there is some benefit in terms of greenhouse gas emissions reductions. However, the TIAX report groups CNG, LNG, and remote NG in one category, obscuring the fact that LNG is a “high-GHG pathway,” to use the words of a previous draft of the TIAX report. CNG from LNG is also not considered as a separate category, even though this could be a major fuel pathway if LNG becomes a substantial supplier of natural gas to California. Compressing natural gas (for use in CNG vehicles) derived from LNG is the highest-emissions fuel pathway for natural gas possible. This conclusion becomes clear when we consider the pathway of such a process:

- Extraction

⁶ California Energy Commission, Revised Final Well-to-Wheels Analysis, August 1, 2007, p. .
Online at: <http://energy.ca.gov/2007publications/CEC-600-2007-004/CEC-600-2007-004-REV.PDF>.

- Liquefaction
- Transportation
- Regasification
- Compression
- Transportation
- Use in vehicles

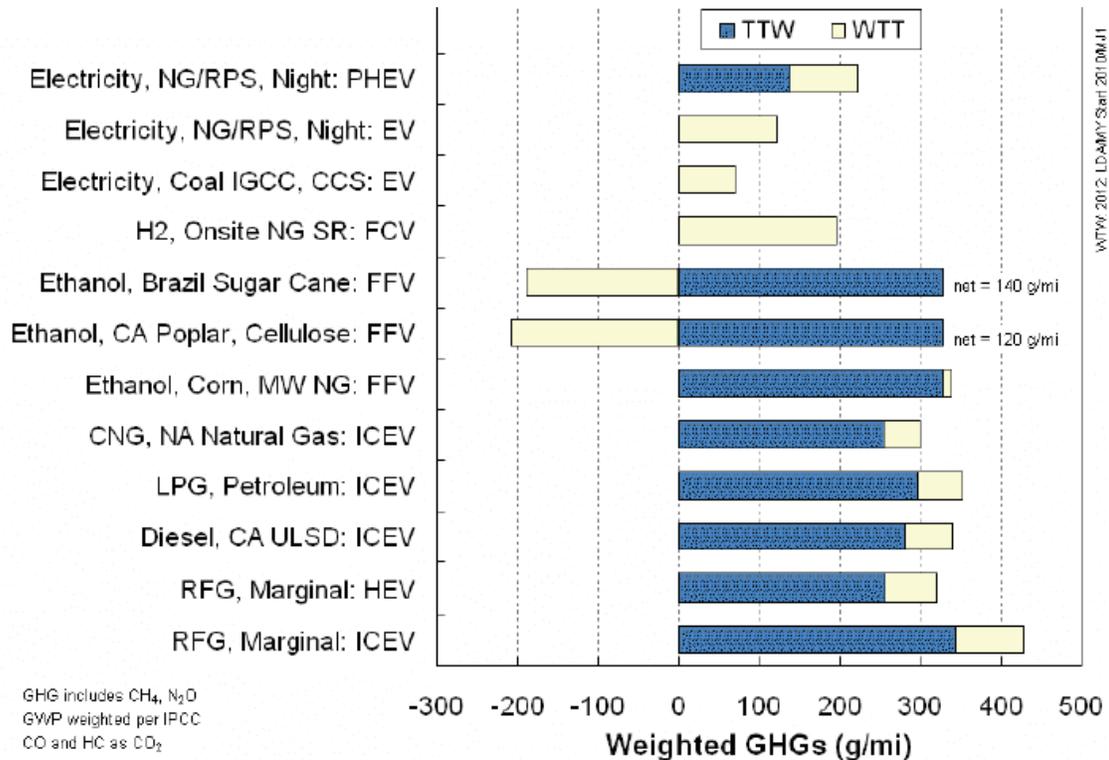
Moreover, the TIAX analysis fell short of a complete lifecycle analysis for LNG, even in the final report. TIAX acknowledged in public forums that parts of the lifecycle of LNG, such as re-gasification, were not part of the GREET model used by TIAX for its report. Under a more comprehensive analysis, it is very likely that LNG vehicles will lead to higher greenhouse gas emissions, not less.⁷

The key point is that all natural gas is not created equal – we must consider, if we are to take climate change seriously, the source of natural gas and its concomitant lifecycle emissions.

Last, the TIAX report also shows that electric vehicle (EVs) and plug-in hybrid electric vehicles (PHEVs) are a far better transportation mode in terms of GHG reductions, supporting our earlier point about switching from natural gas vehicles to EVs and PHEVs (Figure 2). Cost of course must be considered, but once EVs and PHEVs become available, it is highly likely that any premium for up-front costs will be quickly offset by lower fuel costs because electricity is so much cheaper than gasoline or natural gas as a transportation fuel (75 cents or so, according to Plug-in Partners, versus today's above \$3.00 per gallon gasoline).

⁷ The CE Council submitted comments on the draft TIAX report, appended as Appendix A to these comments.

Figure 2. Lifecycle GHG emissions of various transportation fuel pathways for mid-size cars, 2012.



II. Conclusion

Natural gas is a fossil fuel and, as such, is very much part of the problem. With coal effectively ruled out for new power facilities and contracts, natural gas emissions must be reduced dramatically in order to achieve the AB 32 goals. Through creating a broad-based cap and trade system, which includes the natural gas sector, the Commission will help ensure that a cap and trade system, if one is created, works as intended. However, to have the desired impact, lifecycle emissions of all energy sources must be fully considered and internalized to the markets.

Respectfully submitted,

TAM HUNT

A handwritten signature in black ink, consisting of stylized, overlapping letters that appear to read 'TH' followed by a long horizontal stroke.

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Dated: January 8, 2008

CERTIFICATE OF SERVICE

I hereby certify that I have served by electronic service a copy of the foregoing REPLY COMMENTS OF THE COMMUNITY ENVIRONMENTAL COUNCIL ON NATURAL GAS SECTOR POINT OF REGULATION ISSUES on all known interested parties of record in R.06-04-009 included on the service list appended to the original document filed with this Commission. Service by first class U.S. mail has also been provided to those who have not provided an email address.

Dated at Santa Barbara, California, January 8, 2008.



Tam Hunt



June 8, 2007

California Energy Commission
Docket Office
Attn: Docket 06-AFP-1, "Alternative Fuels Transportation Plan"
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

Dear Mr. Addy,

We previously submitted comments on the draft TIAX reports on March 24, 2007. We re-submit these comments below because we do not know if our previous comments were considered in TIAX's revisions between March and the present due to the fact that the updated reports have not been posted. The presentations at CEC's May 31st workshop suggest that TIAX has not fully considered our previous comments relating to the increased greenhouse gas emissions from LNG. To the contrary, presentations from TIAX and CEC appear to reflect backsliding on this key issue in that they further downplay the difference between natural gas, CNG and LNG - conflating these energy sources and treating them all as though the more favorable emissions aspects of domestic natural gas apply also to CNG and LNG.

However, lifecycle greenhouse gas emissions from domestic natural gas, CNG and LNG can be widely divergent. Recent peer-reviewed reports, most notably a recently published report from a team at Carnegie Mellon University, found that GHGs from LNG can be as high as coal, when both are measured on a lifecycle emissions basis. (See attached a draft of the CMU report).

Accordingly, with natural gas forming the primary energy source for many different energy pathways in California - e.g., electricity, heating, cooling and cooking, transportation through CNG and LNG, and transportation and/or power production from hydrogen with natural gas as the feedstock - it is absolutely imperative that the final AB 1007 reports fully reflect the impact on California's greenhouse gas emissions by relying on LNG as a source of natural gas in the future. With Sempra's Baja LNG import terminal set to come online next year, and eventually supplying up to 20% of California's total natural gas demand, the increased GHGs

resulting from LNG imports may well by itself torpedo California's efforts to reduce GHGs from its transportation sector.

With the draft TIAX report making basic mistakes like projecting Chile as a source of LNG for California (Chile plans to import LNG, not export it), it is clear that much work remains to be done on the TIAX reports.

Our March 24, 2007, comments on the TIAX reports follow:

We read with great interest the draft consultant report from TIAX, LLC, pursuant to AB 1007. With our organization's efforts focused on weaning our region from fossil fuels in about two decades (www.fossilfreeby33.org), AB 1007 is clearly a step in the right direction for us and for California.

In these comments, we focus on one technology area: natural gas and LNG. While the draft report does a great job of distinguishing between corn and cellulosic feedstocks for ethanol, and hydrogen from fossil fuels versus hydrogen from renewable electricity – and the lifecycle impacts of these differences – it doesn't do as good a job of distinguishing between natural gas, compressed natural gas (CNG) and liquefied natural gas (LNG). This distinction is as important, or potentially more important, than the distinction between different types of ethanol and hydrogen.

This is the case because, as the draft report makes clear in some places (if one delves deep) CNG and LNG produce high emissions levels, whereas domestically produced natural gas produces much fewer emissions – when compared to coal or petroleum. In other words, CNG and LNG do not share the same environmental benefits that domestic natural gas enjoys.

This distinction is at times spelled out in the draft report. However, it should be made clear whenever natural gas, CNG or LNG are mentioned, that there is a large difference between these fuel types, in terms of both criteria pollutants and greenhouse gases when each fuel type is assessed on a lifecycle basis. These categories should not be lumped together, as they often are in the draft.

This distinction is even more important when we consider that the draft report discussions of electric vehicles (using electricity from predominantly natural gas) and hydrogen vehicles (using hydrogen from natural gas) rest on the assumption that the natural gas used for these

purposes is domestically produced natural gas. When we factor in the “high GHG pathway” for LNG for natural gas-fired electricity and steam reformed natural gas to produce hydrogen, it should be clear that the actual greenhouse gas emissions from these technologies will be far higher when LNG supplies the natural gas.

Similarly, when CNG is created from LNG, the emissions concerns become even more pronounced because of the additional energy required to compress natural gas from LNG. The full pathway for this fuel source is: discovery and extraction, liquefaction, transportation, re-gasification, transportation, compression, transportation, use in vehicles. It should be clear that this process takes far more energy than simply compressing domestic natural gas and, therefore, there are substantially higher greenhouse gas emissions from this process.

Last, in discussions with TIAX staff, we learned that the GREET model used by TIAX omits certain key energy requirements for LNG, such as onshore re-gasification energy requirements. With any LNG import terminal in California likely to require additional natural gas for re-gasification (instead of seawater re-gas facilities because of concerns about sea life entrainment), this will substantially add to the emissions profile of LNG in California.

If all this was just theoretical, we wouldn’t be writing this letter. However, with LNG projected to supply 20 to 30 percent of California’s natural gas over the next decade or so, this high GHG pathway will very likely take the state of California backwards in meeting its AB 32 goal – not forwards as LNG proponents would advocate.

In other words, if LNG does become a large supplier of natural gas to California, much, if not all, of the greenhouse gas emissions reductions in the electricity and natural gas sector may be mooted by LNG imports.

Sincerely,

A handwritten signature in black ink, appearing to read 'TH', with a long horizontal flourish extending to the right.

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